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EXAMINER

GREENE, DANIEL LAWSON

ART UNIT

PAPER NUMBER

3663

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/751,349	Applicant(s) BROACH ET AL.	
	Examiner Daniel L. Greene Jr.	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Examiners Note: Applicant's inventive concept is directed towards saving manufacturing costs by the application of a venturi shape to the flow through holes of a debris filter located at the bottom nozzle of a nuclear reactor fuel assembly by milling only two discrete chamfers approximating a venturi into the inlet of flow through holes in said debris filter. In this and the previous Office Actions, the Examiner has set forth how the nuclear reactor fuel assembly art is well aware of the benefits of a venturi profile and it would be obvious to apply the benefits of a venturi shape in any location that would benefit from such a shape and it should be noted that applicants claim language of claims 1 and 12 is nothing more than another way of describing an actual venturi itself, i.e. a series of a plurality of concentric countersinks of different included angles and depths, etc.

Oath/Declaration

1. The Supplemental Declaration received 5/15/2006 is acknowledged, however as previously stated in section 3 of the 11/16/2005 Office Action it is not seen where any factual evidence is presented within the declaration. It is also considered that Applicant's statement "This is not just the opinion of an engineer, but the conclusion of an expert." (Page 9 middle of last paragraph) supports the Examiners contention that the declaration is indeed "the opinion" of Mr. Young. Again Mr. Young's statements alone without presentation of factual evidence can only be construed as an opinion and no patentable weight can be given to an opinionated declaration. Consequently, said declaration cannot be relied upon as an adequate response to the issues presented in

the previous Office actions. Since Applicant is of the opinion that Mr. Young is an expert in the field then it is considered Mr. Young knew of and had access to evidence in support of his conclusion and should have submitted documentary evidence in support of his claims. Since Applicant was informed of the requirement and no documentary evidence was submitted, one can only conclude that such does not exist. Accordingly Mr. Young's opinionated declaration is of no probative value.

Response to Arguments

2. Applicant's arguments and amendments concerning sections 3C, 4C, 5A, 5D, 5E, 5F, 5H, 5I, 5J, 5K, 6, 8, and 9 of the previous Office action mailed 11/16/2005 are persuasive and as such **ONLY** those rejections are hereby withdrawn.
3. Applicant's argument's regarding sections 3A, 3B, 4A, 4B, 5B, 5C, and 7 and 10 of said previous Office action have been fully considered but they are not persuasive and are maintained and incorporated herein by reference.

Regarding sections 3A, 3B, 4A, 4B, 5B and 5C, it appears applicant is attempting to introduce new matter into the claims as explained in the previous Office action **AND** attempting to claim subject matter that is broader than the enabling disclosure, i.e. **"a series of a plurality of"**. That is, the specification and drawings and charts appear to set forth only a double chamfered inlet, however applicant is attempting to claim something broader than a double chamfered inlet. It also appears that Applicant agrees with the Examiner in the definitions of "series" and "plurality" (paragraph spanning pages 10 and 11 of the

remarks received 4/20/2006). However Applicant's use of these words in the claims does not connote any particular chamfers per se, i.e. a particular number of chamfers or orientation of them.

For example, with the current claim language, it is not possible to ascertain EXACTLY how many chamfers are claimed or at what point another invention would infringe on the claim language. To put it another way, the claim language is so broad as to read on the venturi profiles already of record as each venturi does indeed have "a series of a plurality" of discrete chamfers (or "a number of more than one discrete chamfers coming one after another in spatial succession") with adjacent chamfers at different angles to the axial direction of the fuel rods because the limitation "a series of a plurality" has no definite metes and bounds and when interpreted in its broadest sense means a number of more than one discrete chamfers coming one after another in spatial succession which reads on the curve of inlet of a venturi. A curve is made up of an infinite number of tangential lines which would each be discrete and at different angles. The claim language does not connote only two chamfers or a double chamfered inlet. Again, Applicants claim language is so broad that it reads on the venturis already of record.

Although the claims are interpreted in light of the specification, limitations from the specification are NOT imported into the claims. The Examiner must give the claim language the broadest reasonable interpretation the claims allow.

See MPEP 2111.01, which states

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While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)

It appears applicant's invention is focused on using only two straight chamfers to approximate a venturi to minimize manufacturing costs. This is further evidenced by Figures 5, 6 the sentence spanning page 8 of the specification as filed, and the tables within said specification. However the Examiner has set forth in previous Office actions how the use of a venturi in the nuclear art is notoriously old and well known and as such it is considered that its application to ANY area of a nuclear reactor where the benefits of a venturi could be utilized would be **an obvious place to employ a venturi therein.**

4. Regarding sections 7 and 10, **it is noted that the limitation "pressurized water reactor" is found in the preamble and is considered a statement of intended use and as such no patentable weight has been given to the limitation "pressurized".** The recitation **"pressurized"** has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand

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alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's statement that the Johansson references are only directed to a boiling water reactor is not considered correct for at least the following reasons;

1. '640 makes the opening statement that the invention relates to "nuclear reactors in general" (Column 1, line 6) which is obviously generic to both PWR's and BWR's.
2. The Shallenberger and Johannsson patents are classified in the same class and subclasses, i.e. 376/ 352, 313, 443, etc.

Regardless of whether or not Johannsson is directed towards BWR's "in particular", the teachings cannot be ignored especially as the Examiner has shown how the Patent Office itself classified the inventions into the same subclasses.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Further, Applicant's arguments are unpersuasive as applicant has not shown that the references do not teach what the examiner has stated they teach, nor has applicant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

In response to applicant's argument that Tucker is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Tucker is analogous art because it is teaching the principles of fluid flow through various orifice geometries for the benefits of minimizing pressure losses occurring within said orifices.

Again, all of the Johannsson references show bottom nozzle filters with venturi profiles, they discuss the benefits of the venturi, and applicants invention is merely an obvious improvement over these references either through optimization or as taught explicitly by Tucker.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

5. Claims 1, 2 and 4-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the

time the application was filed, had possession of the claimed invention for the reasons set forth in section 3 above as well as those set forth below.

A. Applicant's 4/20/2006 amendment introduced the limitation "...concentric countersinks of different included angles and depths into the coolant flow through hole." to claims 1 and 2. This limitation is considered new matter since it is not seen where the specification uses such a phrase in the application as filed.

B. Applicant's 4/20/2006 amendment introduced the limitation "...wherein the flaring at the lower face of said plate comprises a series of a plurality of straight, discrete, adjacent chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of said fuel rods."

(Underlining added to show added limitations) to claim 12. This limitation is considered new matter since it is not seen where the specification uses such a phrase in the application as filed.

6. Claims 1, 2 and 4-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

A. Applicant's 4/20/2006 amendment introduced the limitation "...concentric countersinks of different included angles and depths into the coolant flow through hole." to claims 1 and 2. There is no adequate description nor enabling disclosure of what all is meant by and encompassed by the phrase "...concentric

countersinks of different included angles and depths into the coolant flow through hole.” See the discussion of this issue in section 5 above.

B. Applicant’s 4/20/2006 amendment introduced the limitation “...wherein the flaring at the lower face of said plate comprises a series of a plurality of straight, discrete, adjacent chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of said fuel rods.”

(Underlining added to show added limitations) to claim 12. There is no adequate description nor enabling disclosure of what all is meant by and encompassed by the phrase “...wherein the flaring at the lower face of said plate comprises a series of a plurality of straight, discrete, adjacent chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of said fuel rods.” (Underlining added to show added limitations) See the discussion of this issue in section 5 above.

7. Claims 1, 2 and 4-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claims 1 and 12 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation “a series” because the figures only show one or two chamfers not a series. The term “series” connotes a broader meaning than the two adjacent chamfers disclosed within the specification. Additionally a series of a plurality of discrete chamfers does not connote any particular

chamfers, per se; hence the metes and bounds of the claim are undefined. See the discussion of this issue in section 3 above.

B. Claims 1 and 12 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation “a plurality” because the figures only show one or two chamfers. The term “plurality” connotes a broader meaning than the one or two adjacent chamfers disclosed within the specification. Additionally a plurality of discrete chamfers does not connote any particular chamfers, per se; hence the metes and bounds of the claim are undefined. See the discussion of this issue in section 3 above.

C. Applicant’s 4/20/2006 amendment introduced the limitation “...concentric countersinks of different included angles and depths into the coolant flow through hole.” to claims 1 and 2. The claims are vague indefinite and incomplete as to what all is meant by and encompassed by the phrase “...concentric countersinks of different included angles and depths into the coolant flow through hole.” See the discussion of this issue in section 5 above.

D. Applicant’s 4/20/2006 amendment introduced the limitation “...wherein the flaring at the lower face of said plate comprises a series of a plurality of straight, discrete, adjacent chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of said fuel rods.”

(Underlining added to show added limitations) to claim 12. The claims are vague indefinite and incomplete as to what all is meant by and encompassed by the phrase “...wherein the flaring at the lower face of said plate comprises a series of

a plurality of straight, discrete, adjacent chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of said fuel rods.” See the discussion of this issue in section 5 above.

E. Claims 1 and 12 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation “a series of a plurality” because the figures only show one or two chamfers. The term a series of a plurality is not defined in the specification, connotes other embodiments other than those disclosed and cannot be given any definite particular meaning, that is the phrase “a series of a plurality” has no definite meaning and does not connote any particular number of, orientation of or specific arrangement and hence the metes and bounds of the claims are undefined.

Claim Rejections - 35 USC § 103

8. Note that the 103 rejections of section 7 and 10 of the previous Office action mailed 11/16/2005 have been maintained as explained in section 4 above and are incorporated herein by reference.

9. Claims 1, 2, 4 and 6-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shallenberger in view of either the Mechanical Engineering Handbook, CRC Press LLC, ©1999 or the Industrial Burners Handbook, CRC Press LLC ©2003 or the Mechanical Engineering Handbook, SIXTH EDITION,

**McGRAW-HILL BOOK COMPANY, INC, ©1958 and further in view of either
Mechanical Engineering Handbook, SIXTH EDITION, McGRAW-HILL BOOK
COMPANY, INC, ©1958 or Tucker.**

Shallenberger discloses claim 1, a fuel assembly (10) for a pressurized water nuclear reactor including a plurality of elongated nuclear fuel rods (22) having an extended axial length, at least a lowermost grid (20) supporting said fuel rods (22) in an organized array and having unoccupied spaces (52) defined therein adapted to allow flow of fluid coolant there through and past said fuel rods (22) when said fuel assembly (10) is installed in the nuclear reactor and a plurality of guide thimbles (18) extending along said fuel rods (22) through and supporting said grid (20), a debris filter bottom nozzle (12) disposed below said grid (20), below lower ends of said fuel rods (22), supporting said guide thimbles (18) and adapted to allow flow of fluid coolant into said fuel assembly (10), said debris filter bottom nozzle (12) comprising a substantially horizontal plate (46) extending substantially transverse to the axis of the fuel rods (22) and having an upper face directed toward said lowermost grid (20), said upper face of said plate (46) having defined there through at least two different hole designs, the first hole design being a plurality of holes (66) receiving lower ends of said guide thimbles (18) where they are supported by said plate (46) and the second hole design being a plurality of flow through holes (48) extending completely through said plate (46) for the passage of coolant fluid from a lower face of said plate to the upper face of said plate, each of said coolant flow through holes (48) extending

substantially in the axial direction of said fuel rods (22), in fluid communication with said unoccupied spaces (52), and in the extended direction at least some of said coolant flow through holes (48) having a profile substantially of a venturi, in Figures 1-10 and column 3 lines 24-54 and 67+, and columns 4-6, however Shallenberger does not appear to explicitly disclose that the flow through holes (48) include:

- A. a flaring at both ends,
- B. the flaring at the lower face comprises a series of a plurality of concentric countersinks of different included angles and depths into the coolant flow through hole.
- C. the flaring at the lower face comprises a series of a plurality of straight, discrete, adjacent, chamfers with each adjacent chamfer at a different angle than another adjacent chamfer relative to the axial direction of the fuel rods
- D. that some of the coolant through holes have a discrete double chamfered inlet with each adjacent chamfer of the double chamfered inlet at a different angle than the other adjacent chamfer relative to the axial direction of the fuel rods.

Regarding limitation A, “flaring at both ends”,

Fluid Mechanics in Chapter 3 of the Mechanical Engineer’s Handbook, CRC Press LLC ©1999 teaches on page 3-190 that a conical diffuser section downstream from the throat of a venturi gives excellent pressure recovery.

Chapter 3 Fluid Flow of the Industrial Burners Handbook, CRC Press LLC ©2003 also teaches in Figure 3.3 and section 3.3.3 that a conical diffuser section downstream of the throat of a venturi provides a transition to the downstream section and that typically this section is designed with small transition angles to provide smooth flow in order to reduce pressure losses.

Chapter 3 pages 59-65 of the Mechanical Engineering Handbook, SIXTH EDITION, MCGRAW-HILL BOOK COMPANY, INC, ©1958 teach the advantages of orifice geometry concerning fluid flow coefficients, divergence, friction, etc., through various orifices including venturis.

These references are analogous art because they are directed towards fluid flow through an orifice, which is directly pertinent to applicant's particular problem and current concern.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to provide flaring at both ends of the flow through holes, because of the advantages of increased flow, reduced pressure losses, smoother downstream flow, etc., as such results are no more than basic mechanical principles of fluid flow dynamics available within the art.

Regarding the limitations B, C and D

Chapter 3 pages 59-65 of the Mechanical Engineering Handbook, SIXTH EDITION, MCGRAW-HILL BOOK COMPANY, INC, ©1958 further teach fluid flow through venturi's and orifices and that beveling the sharp upstream edge, even slightly, increases the discharge of an orifice. (see page 3-64 Rounding)

Rounding the inlet edge of an orifice can obviously take many forms (Fig. 6), from multiple angle bevels, to rounding. In the case of a rounded edge, it is understood that the inlet angle would be comprised of an infinite number of chamfer angles, including those proposed by applicant.

As stated before, this reference is analogous art because it is teaching the principles of fluid flow through venturi's and orifices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to optimize the flow characteristics of the inlet of the flow holes by increasing the bevel with a double edge chamfer as well as a double angle chamfer approximating a curved surface in order to increase the discharge of the orifice as such results are no more than optimization of the previous art as Applicant's disclosure states on page 2 lines 3 and page 8 lines 5-7 by using old and well known basic mechanical principles of fluid flow dynamics available within the art.

If Applicant is still of the opinion that Shallenberger as modified above does not specifically disclose that the flow through holes (48) include a double angle chamfer on the inlet end the Tucker can be relied upon to show such.

Tucker et al. teaches benefits of a flared/double angle inlet chamfer include; **an appreciable reduction in pressure loss across the entire apparatus relative to those apparatus without a flared inlet** (column 19 lines 22-27), minimization of pressure losses in the inlet due to inlet boundary wall

imperfections (column 15 lines 12-22), "having a chamfered inlet portion which is rounded in both the upstream and downstream ends...of the entry portion would further improve the figure of merit (i.e. how well it works) relative to entry portions of the type shown in figures 12 and 13" (column 17 lines 55-60) and **"a double chamfered inlet portion with the upstream angle having a steeper angle than the downstream chamfer...would also improve the figure of merit (i.e. how well it works) relative to entry portion in Fig 11 (Fig. 11 is a single chamfer inlet) "** (column 17 lines 62+) in addition to Figures 14 and 15, columns 1 lines 19-23, column 14 lines 3-61, and 65+, column 16 lines 1-5, and column 18 lines 1-3.

It is further noted that Tucker et al. sets forth some of the theory behind the motivation to utilize venturi like or flared inlet geometries when dealing with fluid flow in column 14 lines 40-50, i.e. flared inlet portions reduce the fluid acceleration gradients within the inlet portion consequently reducing the associated fluid viscous shear induced pressure losses which are in addition to all other fluid viscous shear induced pressure losses within the system.

Tucker is analogous art because it is teaching the principles of fluid flow through various orifice geometries for the benefits of minimizing pressure losses occurring within said orifices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to optimize the flow characteristics of the inlet of the flow holes of Shallenberger as modified above by utilizing the teachings of Tucker et

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al to include a double edge chamfer (Figure 15) as well as a double angle chamfer approximating a curved surface (Figure 14) for the benefits of increasing the discharge of the orifice, minimizing pressure losses, minimizing effects of inlet boundary wall imperfections, etc. as taught to be old and advantageous by Tucker et al. as such results can also be considered no more than optimization of the previous art as even Applicant's own disclosure states on page 2 lines 3 and page 8 lines 5-7 by using old and well known basic mechanical principles of fluid flow dynamics available within the art.

Claims 6, 16 and 17 are disclosed in The Mechanical Engineer's Handbook SIXTH EDITION, MCGRAW-HILL BOOK COMPANY, INC, ©1958 section 3 pages 59 – 65, wherein it is apparent Applicant has translated/converted the table of claim 5 into mathematical equations stemming from typical venturi and orifice geometric relationships. As such, applicants table and values are no more than standard mechanical properties/geometric relationships available within the art.

See MPEP § 2144.05 II “Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” “The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233,235 (CCPA 1955) and *In re Hoeschelle* 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (underlining added)

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Claim 7 is clearly disclosed in Shallenberger, column 8 lines 2-26.

Claim 8 is clearly disclosed in Shallenberger, Fig 1 and column 5 lines 1-6

Claim 9 is clearly disclosed in Shallenberger, Figures 3 and 6.

Claims 10 and 11 are clearly disclosed in Shallenberger, column 8 lines 2-5.

Claim 12 is clearly disclosed in the rejection of corresponding parts above.

In response to applicant's previous arguments that the Mechanical Engineer's Handbook, CRC Press LLC ©1999, Chapter 3 Fluid Flow of the Industrial Burners Handbook, CRC Press LLC ©2003, and the Mechanical Engineering Handbook, SIXTH EDITION, MCGRAW-HILL BOOK COMPANY, INC, ©1958 is **nonanalogous art**, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, these references are pertinent to fluid flow through orifices, the specific geometries of and uses for venturi's, including industrial applications, etc. Chapter 3, pages 59-65 of the Mechanical Engineering Handbook is specifically directed towards fluid flow through an orifice, which is directly pertinent to applicant's particular problem and current concern, regardless of industrial application.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shallenberger as applied to claims 1, 2, 4 and 6-17 above and further in view of

further teachings of Chapter 42 Fluid Measurements of The Engineering Handbook, CRC Press LLC, ©2000

Shallenberger as modified above further discloses an inlet chamfer angle of 12 to 15 degrees in column 8, claim 3 lines 27-29, however Shallenberger as modified does not expressly disclose the chamfer angle of the outlet of the flow through hole.

As previously discussed, the "inlet chamfer A" falls within the range in the rejection of corresponding parts of section 8 above.

Figure 42.6 Venturi Tube teaches that the diffuser section (outlet chamfer C) of a venturi may have an angle range of 5-15 degrees.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to optimize the flow characteristics of the inlet and outlet of the flow holes because of the advantages of increased discharge flow rate, decreased pressure loss of the orifice, etc., as such results are no more than standard practices and well known basic mechanical principles of fluid flow dynamics available within the art.

See MPEP § 2131.03 II Anticipation of Ranges, MPEP § 2144.05 Obviousness of Ranges as well as MPEP § 2144.05 II "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum

combination of percentages.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233,235 (CCPA 1955) and *In re Hoeschelle* 406 F.2d 1403, 160 USPQ 809 (CCPA 1969)

In response to applicants previous 12/8/04 arguments that MPEP § 2144.05 I and MPEP § 2144.05 II are only directed towards chemical ranges and not combinations of mechanical angles, it must be understood that these sections are not limited to only those specific cases and particular fields of endeavor, but are used as analogies for other arts and other cases. These cases are generalities showing that “The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.” (Underlining added)

In response to applicant's previous 12/8/04 arguments that the examiner's conclusion of obviousness is based upon improper hindsight reasoning and that the examiner is using applicant's claimed invention as an instruction manual or template to piece together the teachings of the prior art by trying to isolate ranges rather than considering the combination of ranges, which are claimed together. In and of itself, It would have been prima-facia obvious to one of ordinary skill in the art to optimize Shallenberger by varying the angles of the inlet and outlet orifices, however the Examiner has provided documentary evidence showing more than one reference has used part if not all of applicant's claimed range of desired coverage, and that those generally knowledgeable in the art are fully aware (and knowledgeable) of the ranges of angles proposed by applicant and, it

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must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JACK KEITH
SUPERVISORY PATENT EXAMINER